

Fig.1

Primer Sequences for PCR amplification of any SSA gene.

Primer names ECP 1 and ECP 2 [Expression cloning Primer (ECP)]

ECP 1 => 5'CAT AAA ATT TCT AAG ACG AAG GAT CCC TAT GTC 3'

ECP 2 => 5'GAG AGA AAG TTC CCC GTG TGA ATT CTA GCT AGG 3'

Fig.2A

ATTGGATCTAAATAATGTACACTGGAGGTTCTGATTTTTCTATTATGAAAGGGATAGA 57
-35 -10 +1
5 ATGTTAAATTTTATGATTTTTTATAATAAAAATAGATATAAAATTTAGTAGTTTTTAT 114
AAATTTTTCATAACAAAGGACTATCCTCCTTGCATAAAATTTCTAAGACGAAAAATC 171
CCTATGTCAAATGAAACACTTTTGAGCGTACTTTCTGATGAAACGCACTTTGCTAAT 228
M S N E T L L S V L S D E T H F A N
10 CTAGTTGATGAACTTCTTCTCATCTTGTTAAAGACAGTATTTTCACTCAAGTAATA 285
L V D E L L L I L V K D S I F T Q V I
15 AAAGGCGAGGGAAAGACAGAATTAAGACATACTTACAGACAACACTGGTAAGTTT 342
K G E G K T E L K D I L T D N T G K F
AAAGAACTTATAGAAAGTGCAGGTAAAGACATACTAAAGAGATACTTACAGACAAT 399
K E L I E S A G K D I L K E I L T D N
20 ACCGGCAATTTTAAAGGACTTATAGAAGGTAATGGTAAGACGGAGGCAAAGAGGTA 456
T G N F K G L I E G N G K T E A K E V
CGCACTAATGAAAAATTCAAGGAGCTTTTTGGAAGCAATGGTAAGGACATACTGAAA 513
R T N E K F K E L F G S N G K D I L K
25 GACATTCTTACTGATAACACCGGTAACCTTTAAAGGCCTTATAGAAAGTGCAGCTAAG 570
D I L T D N T G N F K G L I E S A A K
30 GGTAAGCTGAAAGATCTTCTTATTGATGAAAAATTTCAAAAATTATTCGAGGATGAA 627
G K L K D L L I D E K F Q K L F E D E
ACGAAAGCTGGTCGTGTAAAGAAATACTTACAGACAGCAACGCTAAGGAAATACTC 684
T K A G R V K E I L T D S N A K E I L
35 ACAAATGAAGTAGCAAAGAGGTACTAAAATCCGATAAATTCAAGGAGGCAATAACT 741
T N E V A K E V L K S D K F K E A I T
GGCGATGGTAAGGACGCACTAAAAGAGATACTTACTTGTGATAAATTTAAAGAGGCT 798
G D G K D A L K E I L T C D K F K E A
40 GTAACAGGCAATGGTAAAGACATACTAAAAGGTATACTTACAGATAGCACTGGTAAA 855
V T G N G K D I L K G I L T D S T G K
45 TTAAAGAACTTATAGAAAGTACTAGTAAAGACATACTAAAAGAGATACTTACAGAT 912
F K E L I E S T S K D I L K E I L T D
AATACCGGTAACCTTTAAAGGCCTTATAGAAAGCACTGGCAAGGAGAAAGTAAAGAA 969
N T G N F K G L I E S T G K E K V K E
50 CTTCTTATCGATGGGAAGTTTAAGGACCTGTTTACTGATGCAACAAAAGCCGGTTAT 1026
L L I D G K F K D L F T D A T K A G Y
GTAAAGAAATACTCACGAACGATACAGCTAAGGAAGTACTTACAGATCAAACAGCA 1083
V K E I L T N D T A K E V L T D Q T A
55 AAGGAGGTCCTAAAAGATAGTACAGCTAAAGACATATTAAGGACACAAACGCAGCT 1140
K E V L K D S T A K D I L K D T N A A
GCGGTACTAAAAACAGCACAGCTAAAGAAATACTTACAAACCAAACCGCTAAAGAA 1197
A V L K N S T A K E I L T N Q T A K E
60 GTGCTTACAGATGGTACATCCAAAGAAGTACTAAAAGAGATACTTACTTGTGATAAA 1254
V L T D G T S K E V L K E I L T C D K
TTAAAGAGGCAGTAACAGGAGATGGTAAAGACATACTAAAAGGTATACTTACAGAT 1311
F K E A V T G D G K D I L K G I L T D
65 AGCACTGGTAAGTTTAAAGAACTTATAGAAAGTACTGGTAAAGACATACTGAAAGAC 1368
S T G K F K E L I E S T G K D I L K D

Fig.2B

ATTCTTACAGATAGCACTGGTAAATTTAAAGAACTTATAGAAGTACTGGTAAAGAAC 1425
5 I L T D S T G K F K E L I E V L V K N
AAGCTAAAAGAGATTCTTACAGATAACACCGGTAACCTTCAAAGGGCTTGTAGAAGGC 1482
K L K E I L T D N T G N F K G L V E G
10 GCCGGGAAGGATGAAGCAAAAGCAGTACTTACTGACGAGAAATTTAAAGGCTTGT 1539
A G K D E A K A V L T D E K F K G L F
GATGACAAAACAATAGCTGGCTATGTAAAGAAATACTCACCAGCGAGAAGTTTAA 1596
15 D D K T I A G Y V K E I L T S E K F K
AAACTGTTTGAAGTGCAGGTAAGACTAAAGTAAAGAACTCCTCATTGATGAGAAG 1653
K L F E S A G K T K V K E L L I D E K
TTTCAAAAATTATTTGAGGATGACACGAAAGCCAGTCATGTAAAGAAATACTCAG 1710
20 F Q K L F E D D T K A S H V K E I L T
AACGATACAGCTAAGGAAATACTTACAGATCAAACAGCTAAAGAAGTCCTAAAGGAT 1767
N D T A K E I L T D Q T A K E V L K D
25 AGTACAGCTAAAGAGATATTAAGGACACAAACGCAGCTGCGCTACTAAAAGACAGC 1824
S T A K E I L K D T N A A A L L K D S
ACAGCAAAAGAGGTACTAAAATCCGATAAATTTAAAGATGCAATACTGGTGCTGGT 1881
30 T A K E V L K S D K F K D A I T G A G
AAGGACGCACTAAAAGAGATACTTACTTGTGATAAATTTAAAGAGGCAGTAACAGGC 1938
K D A L K E I L T C D K F K E A V T G
AATGGTAAAGACATACTAAAAGGTATACTTACAGATAGCACTGGTAAATTTAAAGAG 1995
35 N G K D I L K G I L T D S T G K F K E
CTAATAGAAAGCACTGGTAAGGATAAGCTAAAAGAGATTCTTACAGATAACACCGGT 2052
L I E S T G K D K L K E I L T D N T G
AACTTTAAATTTCTTGTAGAAGGCGCCGGTAAGGATGAAGCAAAAGCAGTACTTACT 2109
40 N F K F L V E G A G K D E A K A V L T
CACGAGAAATTTAAAGACTTGTTTAATGTCAAAACAACAGCTGGCTACGTGAAAGAA 2166
H E K F K D L F N V K T T A G Y V K E
45 ATACTTACCAGCGACAAGTTTAAAGAACTGTTTACTGATGCAACAAAAGCTGGCTAC 2223
I L T S D K F K E L F T D A T K A G Y
GTGAAAGAAATACTCACGAACGATACAGCTAAGGAAATACTTACAGATCAAACAGCT 2280
V K E I L T N D T A K E I L T D Q T A
50 AAAGAAGTCCTAAAGGATGGTACAGCTAAAGACATATTAAGGACACAAACGCACGT 2337
K E V L K D G T A K D I L K D T N A R
GCGCTACTAAAAGACAGCACAGCCAAAGAAGTACTAAAATGCGATAAATTTAAGGAA 2394
55 A L L K D S T A K E V L K C D K F K E
GCAATAACAGGTGCCGGTAAAGATGAGCTAAAATACATACTCACTAATAGCGAGTTT 2451
A I T G A G K D E L K Y I L T N S E F
60 AAAAGCTTATTTTCATAGCAAAGATAGCGCTGAAGCTGTTAAAGCAATATTTACCCAC 2508
K S L F H S K D S A E A V K A I F T H
AATAAGTTTAAAGAACTACTTGAACATGCAAGAACAACCCAAACAATACGCAGGCGC 2565
N K F K E L L E H A R T T Q T I R R R
65 TTTGCAAATGCTTTTAGATCAACTAAAAGCGCTAATTACCTGTGGCAGCGGTGATCAT 2622
F A N A L D Q L K A L I T C G S G D H

Fig.2C

5 GCAACAAACTACAAGCCTTTGGAAGTGCACCTATGCACCAAAAAGAAGGAGTTGTGC 2679
A T K L Q A F G S A L C T K K K E L C
AGTAATTTTAGCTGTGCAAACTGCAGTAGTACAACAACTGCATAATTACGTAGCGCT 2736
S N F S C A N C S S T T T A *
10 AGGTGGGGTAATTTACCCCCACCTAGCTAGAATCACACGGGGAACTTTCTCTCTAT 2793
Transcription termination
TACTAGGGTCTTAGGATTTACAAACAAATTACTATGACAGCCA 2836

Fig.3A

ATTGGATCTAAATAATATACACTGGAGGTTTCGTATTTTCTATTATGAAAGGGATAGA 57
-35 -10 +1
ATGTTAAATTTTATGATTTTTTATAATAAAAATAGATATAAAATTTAGTAATTTTAT 114

5 AAATTTTTTTATAACAAAGGACTACCCCTCCCTACATAAAATTTCTAAGACGAAAAATC 171
RBS
CCTATGTCAAATGAAACACTTCTGAGCGTACTTTCTGATGAAACGCACCTTTGCTAAT 228
M S N E T L L S V L S D E T H F A N

10 CTAGTTGATGAACTTCTTCTCAGCTTGTTAAAGACAGTATTTTCACTCAAGTAATA 285
L V D E L L L S L V K D S I F T Q V I

AAAGGCGAGGGAAAGACAGAATTAAGACATTCTTACAGATAGCACTGGCAAGTTT 342
K G E G K T E L K D I L T D S T G K F

AAAGAGCTGATAGGAAGTAGCGGTAAGGATATACTAAAAAGCATACACACAGATGGC 399
K E L I G S S G K D I L K S I H T D G

15 TCAGGCAACTTTAAAGGCCCTTATACAAAGCACAGGTAAGGCAGAAGTAAAGAGGTA 456
S G N F K G L I Q S T G K A E V K E V

CTCACTAATGAAAAATTCAAAGAGCTTTTTTGAAGCGAAGGTAAAGACATACTAAAA 513
L T N E K F K E L F G S E G K D I L K

20 GAGATACTTACAGACAATACCGCAATTTTAAAGGGCTTATAGAAGGCAAAGGTAAG 570
E I L T D N T G N F K G L I E G K G K

GATGAAGCAAAGGGAGTACTTACTGACGAGAAATTTAAAGGCTTGTTTGATGACAAA 627
D E A K G V L T D E K F K G L F D D K

ACAATAGCTGGCTATGTAAAGAAATACTCACCAGCGAGAGTTTAAAAAACTGTTTG 684
T I A G Y V K E I L T S E S L K N C L

25 AAAGGTGCAGGTAAGACTAAAGTAAAGAACTCCTCATTGATGAGAAGTTTCAAAAA 741
K G A G K T K V K E L L I D E K F Q K

TTATTTGAGGATGACACGAAAGCCAGTCATGTAAAGAAATACTTACAGACAGTAAC 798
L F E D D T K A S H V K E I L T D S N

30 GCTAAGGAAATACTCACAAATGAAGTAGCAAAAGAGGTACTAAAATCCGATAAATTT 855
A K E I L T N E V A K E V L K S D K F

AAAGATGCAATAACTGGTGCTGGTAAGGACGCACTAAAAGAGATACTTACTTGCGAT 912
K D A I T G A G K D A L K E I L T C D

AAATTTAAAGATGCAGTAACAGGTAATGGTAAGGACGCACTAAAAGAAATACTTACT 969
K F K D A V T G N G K D A L K E I L T

35 TGCGATAAATTTAAAGATGCAGTAACAGGCAATGGTAAGACAAGCTAAAAGAGATT 1026
C D K F K D A V T G N G K D K L K E I

CTTACTCACGAGAAGTTTAAAGCACTCATAGAGAGTGAAGGCAAAGACATACTGAAA 1083
L T H E K F K A L I E S E G K D I L K

40 GAAATTCCTTACAGATAGTACCGGTAAATTTAAAGAGCTAATAGAAAGCACTGGTAAA 1140
E I L T D S T G K F K E L I E S T G K

GACAAGCTAAAAGAGATTTTACAGATAACACCGGTAACCTTTAAAGGGCTTGTAAG 1197
D K L K E I F T D N T G N F K G L V E

GGCGCCGGTAAGGATGAAGCAAAAGCAGTACTTACTCACGAGAAATTTAAAGACTTG 1254
G A G K D E A K A V L T H E K F K D L

45 TTTAATGACAAAACAACAGCTGGCTACGTGAAAGAAATACTCACCAGTGATAAGTTT 1311
F N D K T T A G Y V K E I L T S D K F

AAAAAATTATTTGAGGACAATACCAAAGCTGGCTACGTGAAAGAAATACTCACGAAC 1368
K K L F E D N T K A G Y V K E I L T N

Fig.3C

GATACAGCTAAGGAAATACTCACAAATCAAACAGCTAAAGAAGTCCTAAAAGACAGC 1425
D T A K E I L T N Q T A K E V L K D S
5 ACAGCCAAAGAAATACTAAAATGCGATAAATTTAAGGACGCAATAACAGGCGCTGGT 1482
T A K E I L K C D K F K D A I T G A G
AAAGATGAGCTAAAATACATACTCACTAATAACGAGTTTAAAAGCTTATTTGATAGC 1539
K D E L K Y I L T N N E F K S L F D S
10 AAAGATAGCGCTGAAGCTGTTAAAGCAATATTTACCCACAATAAGTTTAAAGAACTA 1596
K D S A E A V K A I F T H N K F K E L
CTTAAACGTGCAAGGACAACCCAAAAAATACGGCGGGCGCTTGCAGCTGCTTTAGAT 1653
L K T C K D N P K N T A A L A A A L D
GAACTAAAAGATCTAATTACGTGTGACCGCAATAATCATGCAACAAACTACAAGCC 1710
E L K D L I T C D R N N H A T K L Q A
15 TTTGGAAGTGCACTATGCACCAGAAAAAAGAGTCGTGCGATAATTTTAGCCCTGCA 1767
F G S A L C T R K K E S C D N F S P A
AGCTGCAGTAGTACAGCAGCTACATAATTACGTAGCGCTAGGTGGGGGTAAATTACC 1824
S C S S T A A T **Transcription termination**
20 CCCACCTACGTAGAATCACACGGGGAACTTTCTCTCTATTACTGAGGTCTTAGGATT 1881
TACTTTCAAATTACTATGACAGCCGATTAAATTATTATGACAGACGATACACTTTT 1937

Fig.4A

ATTGGATCTAAATAATGTACACTGGAGGTTCTGATTTTTCTATTATGAAAGGGATAGA 57
-35 -10 +1
ATGTTAAATTTTATGATTTTTTATAATAAAAATAGATATAAAATTTAGTAGTTTTAT 114
AAATTTTTCATAACAAAGGACTATCCTCCTTGCATAAAATTTCTAAGACGAAAAATC 171
RBS
CTTATGTCAAATGAAACACTTCTGAGCGTACTTTCTGATGAAACGCACTTTGCTAAT 225
M S N E T L L S V L S D E T H F A N
CTAGTTGATGAACCTTCTTCTCAGCTTGGTTAAAGACAGTATTTTCACTCAAGTAATA 285
L V D E L L L S L V K D S I F T Q V I
AAAGGCGAGGGAAAGACAGAATTAAGACATTCTTACAGATAGCACTGGCAAGTTT 342
K G E G K T E L K D I L T D S T G K F
AAAGAGCTGATAGGAAGTAGCGGTAAGGATATACTAAAAAGCATACTCACAGATGGC 399
K E L I G S S G K D I L K S I L T D G
TCAGGCAACTTTAAAGGCCTTATACAAAGCACAGGTAAGGCAGAAGTAAAGAGGTA 456
S G N F K G L I Q S T G K A E V K E V
CTCACTAATGAAAAATTCAAAGAGCTTTTTTGAAGCGATGGTAAGGATATATTA AAA 513
L T N E K F K E L F G S D G K D I L K
GACATACTCACAGATAGCACTGGTAAGTTTAAAGAGCTGATAGGAAGTAGCGGTAAG 570
D I L T D S T G K F K E L I G S S G K
GACATACTAAAAACATTCTTACAGATAGCACCGGTAAGTTTAAAGAACTTATAGAA 627
D I L K N I L T D S T G K F K E L I E
AGTGCAGGTAAGGGTAAGCTGAAAGACCTTCTTATTGATGGAACTTTAAAAAATTA 684
S A G K G K L K D L L I D G N F K K L
TTTGAGGATGACACGAAAGCTGCTCATGTAAAAGAAATACTTACAGACAGCAACGCT 741
F E D D T K A A K V K E I L T D S N A
AAGGAAATACTCACAAATGAAGTAGCAAAAGAGGTACTAAAATCCGATAAATTTAAA 798
K E I L T N E V A K E V L K S D K F K
GATGCAATAACTGGTGCTGGTAAGGACGCACTAAAAGAGATACTTACTTGCATAAA 855
D A I T G A G K D A L K E I L T C D K
TTTAAAGATGCAGTAACAGGCAATGGTAAGGACGCACTAAAAGAAATACTTACTTGC 912
F K D A V T G N G K D A L K E I L T C
GATAAATTTAAAGATGCAGTAACAGGCAATGGTAAGACAAGCTAAAAGAGATTCTT 969
D K F K D A V T G N G K D K L K E I L

Fig.4B

ACTCACGAGAAGTTTAAAGCACTCATAGAGAGTGAAGGCAAAGACATACTGAAAGAC 1026
T H E K F K A L I E S E G K D I L K D
ATTCTTACAGATAGTACCGGTAAATTTAAAGAGCTAATAGAAAGCACGGGTAAGGAT 1083
I L T D S T G K F K E L I E S T G K D
GAAGCAAAGCAGTACTTACTGACGAGAAATTTAAAGACTTGTTTAATGACAAAACA 1140
E A K A V L T D E K F K D L F N D K T
ACAGCTGGCTACGTGAAAGAAATACTCACCAGTGATAAGTTTAAAAAATTATTTGAG 1197
T A G Y V K E I L T S D K F K K L F E
GACAATACCAAAGCTGGCTACGTGAAAGAAATACTCACGAACGATACAGCTAAGGAA 1254
D N T K A G Y V K E I L T N D T A K E
ATACTTACCAATCATAAATTTAAGGAAGCAATAACTGGCGATGGTAAAGACATACTG 1311
I L T N H K F K E A I T G D G K D I L
AAAGAAATTCTTACAGATAGCACTGGTAACTTTAAAGGCGCAATAACAGGTGCCGGT 1368
K E I L T D S T G N F K G A I T G A G
AAAGATCAGCTAAAATACATACTCACTAATAGCGAGTTTAAAAGCTTATTTGATAGC 1425
K D Q L K Y I L T N S E F K S L F D S
AAAGATAGCGCTGAAGCTGTAAAGAAATATTTACCCACAGTAAGTTTAAAGAACTA 1482
K D S A E A V K E I F T H S K F K E L
CTTAAACGTGCAAGGACAACCCAAAAAATACGGCGGCGCTTGCAGCTGCTTTAGAT 1539
L K T C K D N P K N T A A L A A A L D
GAACTAAAAGATCTAATTACCTGTGGCAGCGGTGATCATGCAACAAACTACAAGCC 1596
E L K D L I T C G S G D H A T K L Q A
TTTGGAAGTGCACTATGCACCAGAAAAAAGAGTCGTGCGATAATTTTAGCTCTGCA 1653
F G S A L C T R K K E S C D N F S S A
AACTGCAGTAGTACAACAACCTGCATAATTACGTAGCGCTAGGTGGGGGTAATTTACC 1710
N C S S T T T A * Transcription termination
CCCACCTAGCTAGAATCACACGGGAACCTTTCTCTCTATTACTAGGGTCTTAGGATT 1767
ACAAACAAATTACTATGACAGCCA 1791

Fig.5

50kD antigen

MSNETLLSVLSDETHFANLVDELLSLVKDSIFTQVIKGEKTELKDILTDSTGKFKELGSSGKDILKSIHTDGSNGFKGLIQSTGKAEVKEVLTNEKF
 IDII
 KLFSGEGKDILKEILTDNTGNFKGLIEGKGKDEAKGVLTDEKFKGLFDDKTIAGYVKEILTSESLKNCLKGAGTKVKKELLID EKFKQLFEDTKASHV
 IDIII IDIV
 KELTDSNAKEILTNEVAKEVLKSDKFDAITGAGKDAALKEILTCDFKDAVTGNGKDALKKEILTCDFKDAVTGNGKDKLKEILTHEKFALIESEG
 IDV
 KDILKEILTDSTGKFKEILIESTGKDKLKEIFTDNTGNFKGLVEGAGKDEAKAVLTHEKFKDLFNDKTTAGYVKEILTSDKFKKLFEDNTKAGYVKEILT
 IDVII IDVIII
 NDTAKEILTNQTAKEVLKDSATAKEILKCDKFDAITGAGKDELKYILTNNEFKSLFDSKDSAEAVKAIFTNKFKEILLKTCCKDNPKNTAALAAALDE
 LKDLITCDRNNHATKLQAFGSALCTRKKECONFSPASCSSTAAT

85kD antigen

MSNETLLSVLSDETHFANLVDELLSLVKDSIFTQVIKGEKTELKDILTDNTGKFKEILIESAGKDILKEILTNDIGNFKGLIEGNGKIEAKEVRTNEKF
 IDI
 KELFGSNGKDILKDILTDNTGNFKKGLIESAAKGKLDLLID EKFKLFEDETAKAGRVKEILTDSNAKEILTNEVAKEVLKSDKFKEAITGDGKDALKE
 IDV IDVII
 ILTCDKFKEAVTGNGKDILKQILTDSTGKFKEILIESISKDILKEILTDNTGNFKGLIESTGKKEVKELLIDGKFKDLFTDATKAGYVKEILTNDTAKAYL
 IDVI
 TDQTAKEVLKDSATAKDILKDTNAAAVLKNSTAKEILTNQTAKEVLTDTGTSKEVLKEILTCDFKFEAVTGDGKDILKGILTDSTGKFKEILIESTGKDILK
 IDII
 DILTDSTGKFKEILIEVLVKNKLKEILTDNTGNFKGLVEGAGKDEAKAVLTDEKFKGLFDDKTIAGYVKEILTSEKFKKLFESAGTKVKKELLID EKFKQL
 IDIII
 FEDDTKASHVKEILTNDIAKEILTDQTAKEVLKDSATAKEILKDTNAAALLKDSATAKEVLKSDKFDAITGAGKDAALKEILTCDFKFEAVTGNGKDIL
 IDVIII
 KQILTDSTGKFKEILIESTGKDKLKEILTDNTGNFKFLVEGAGKDEAKAVLTHEKFKDLFNVKTTAGYVKEILTSDKFKEILFTDATKAYVKEILTNDTAK
 ILTDQTAKEVLKDGTAKDILKDTNARALLKDTAKEVLKCDKFKEAITGAGKDELKYILTNSEFKSLFHSKDSAEAVKAIFTNKFKEILLEHARTTQTR
 RRFANALDQLKALITCGSGDHATKLQAFGSALCTKKKELCSNFSCANCSSTTA

Fig.6

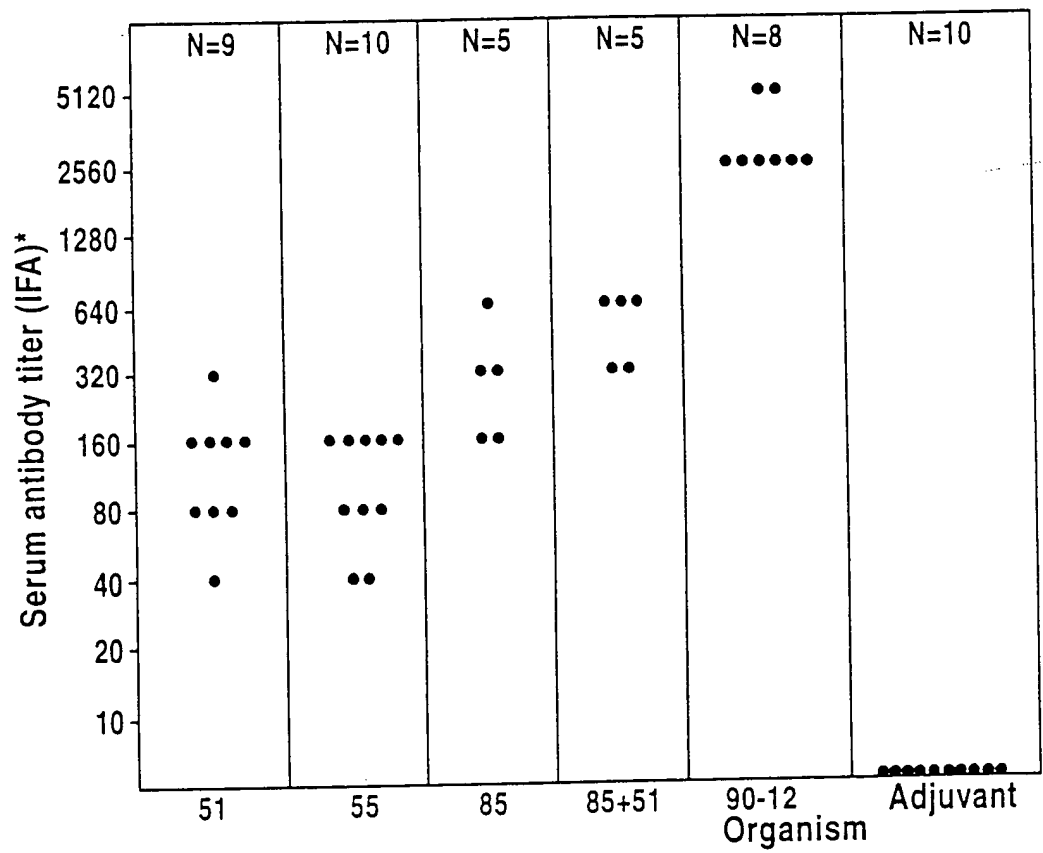


Fig. 7

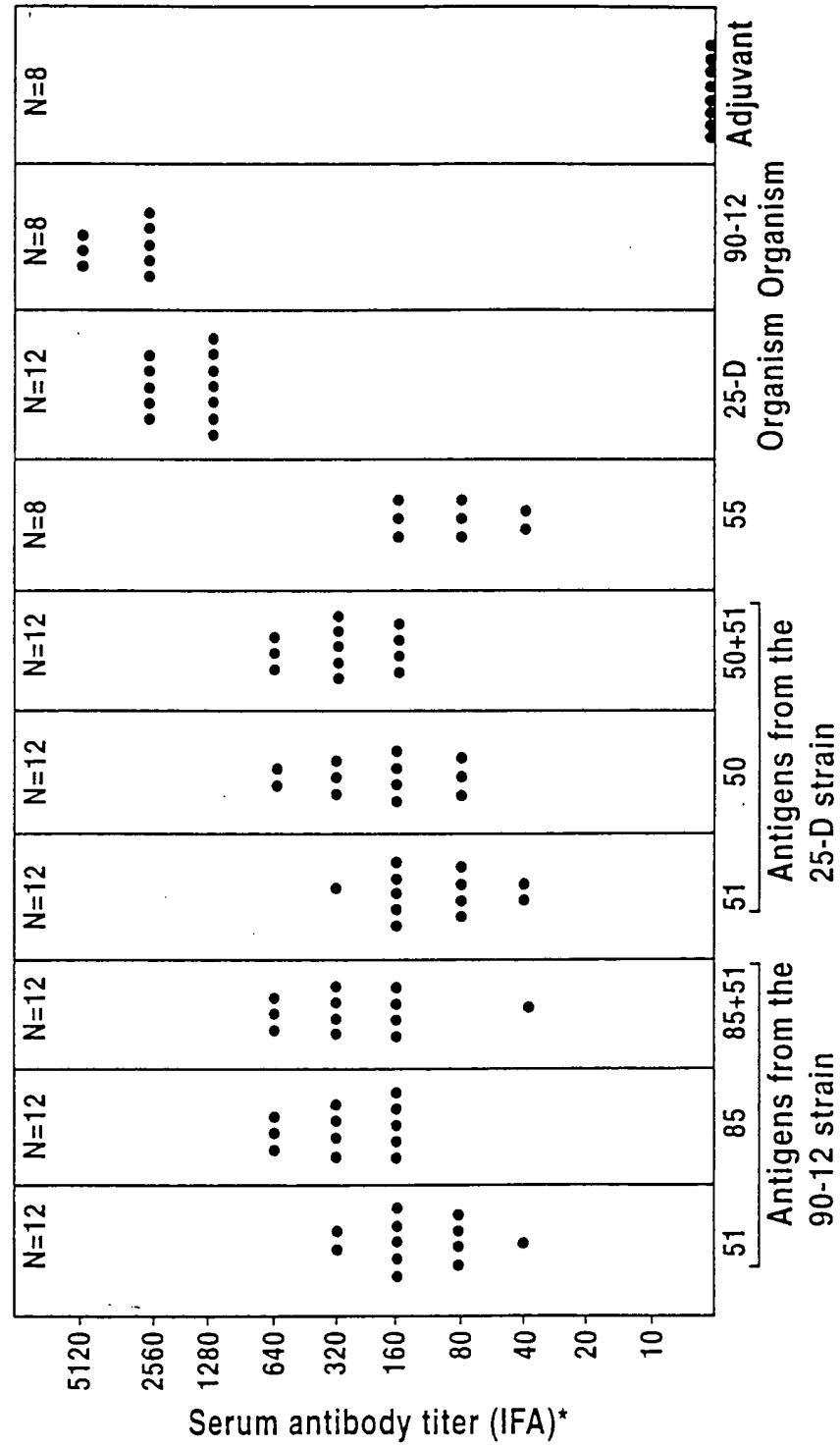


Fig.8

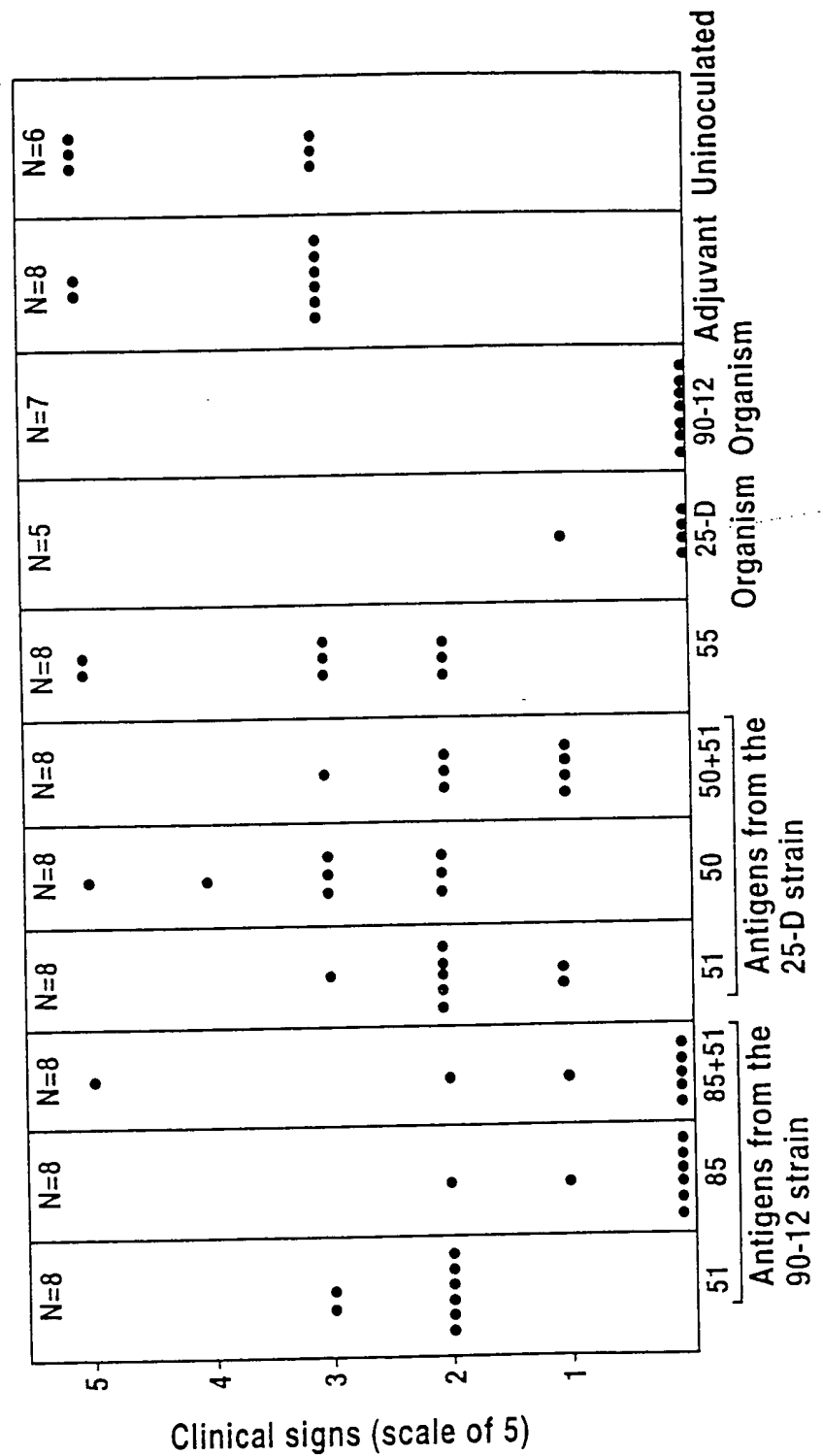
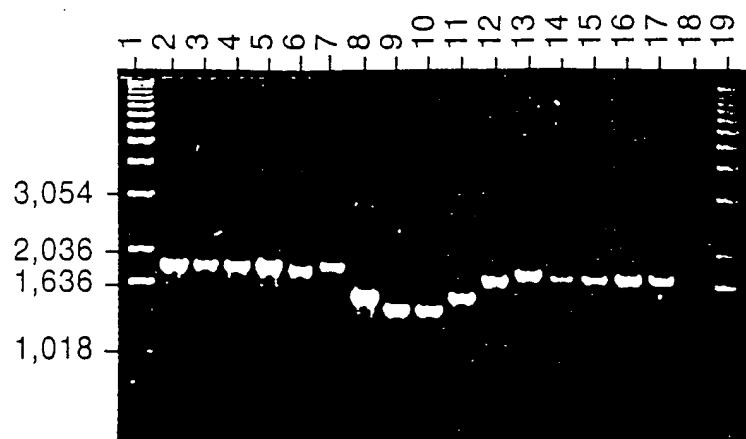


Fig.9



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